

What is claimed is:

1. A substrate support for supporting a substrate, comprising:
a first plate having a first surface adapted to support the substrate and
an opposing second surface;
a second plate coupled to the first plate; and
a heating element disposed between the second surface of the first
plate and a first surface of the second plate, the heating element urged
against the first plate.
2. The support of claim 1, wherein the first plate is fabricated from at least
one material selected from the group consisting of stainless steel, nickel and
nickel alloy.
3. The support of claim 1, wherein the resistive heating element
comprises a metallic sheath circumscribing an electrical conductor, the
metallic sheath fabricated from at least one material selected from the group
consisting of stainless steel, nickel and nickel alloy.
4. The support of claim 3, wherein the metallic sheath and the first plate
are fabricated from materials having substantially identical coefficients of
thermal expansion.
5. The support of claim 3, wherein the metallic sheath and the first plate
are fabricated from stainless steel.
6. The support of claim 1, wherein at least one of the first plate or second
plate has a channel formed therein that receives at least a portion of the
resistive heating element.

7. The support of claim 1 further comprising:
a plurality of substrate support elements disposed on the first surface of the first plate adapted to maintain the substrate and the first surface in a spaced-apart relation.
8. The support of claim 1 further comprising at least one metallic guide disposed between the first and second plates, the metallic guide laterally retaining the heating element relative the first and second plates.
9. The support of claim 8, wherein a portion of the metallic guide is disposed between the second plate and the heating element.
10. The support of claim 8, wherein the metallic guide further comprises:
a first flange disposed parallel to the first surface of the second plate;
a second flange disposed parallel to the first surface of the second plate;
a center portion coupling the first flange to the second flange; and
a heating element receiving channel formed in the center portion.
11. The support of claim 8, wherein the first plate, second plate and metallic guide are spot welded together.
12. The support of claim 8, wherein the resistive heating element urged against the first plate by the guide.
13. The support of claim 8 further comprising:
a plurality of spacers disposed at least on or proximate the first surface of the first plate, the spacers adapted to maintain the substrate and the first surface in a spaced-apart relation.
14. The support of claim 1 further comprising:
a first metallic guide disposed adjacent a portion of the heating element; and

a metallic guide disposed adjacent the portion of the heating element opposite the first metallic guide.

15. The support of claim 1 further comprising:

a thermally conductive filler disposed between the heating element and the first plate.

16. The support of claim 15, wherein the thermally conductive filler is at least one of a conductive paste, a conductive cement, a conductive adhesive, a conductive foam, a conductive gel, a metallic powder, a metallic fiber or a metallic mesh.

17. A substrate support for supporting a substrate, comprising:

a first metallic plate having a first surface and an opposing second surface;

a second metallic plate coupled to the first plate;

at least one guide disposed between the second surface of the first plate and a first surface of the second plate; and

a resistive heating element laterally retained by the guide relative to the second surface of the first plate.

18. The substrate support of claim 17, wherein the guide further comprises a channel formed therein facing the second surface of the first plate, the channel retaining the resistive heating element.

19. The substrate support of claim 18, wherein the channel has a depth less than causes the resistive heating element to be urged against the first plate.

20. The substrate support of claim 18, wherein the channel has a rounded bottom.

21. The substrate support of claim 17, wherein the guide is coupled to the second surface of the first plate.

22. The substrate support of claim 17, wherein the at least one guide further comprises:

a first guide disposed on a first side of the resistive heating element;
and

a second guide disposed on a second side of the resistive heating element.

23. The substrate support of claim 17, wherein the resistive heating element comprises a metallic sheath circumscribing an electrical conductor, the metallic sheath fabricated from material having a coefficient of thermal expansion substantially similar to a coefficient of thermal expansion of the first plate.

24. The substrate support of claim 23, wherein the metallic sheath and at least one of the first plate and the second plate are fabricated from stainless steel.

25. The substrate support of claim 17, wherein the guide further comprises a plurality of tabs extending from either side of a center portion, the tabs coupled to the first plate.

26. The support of claim 17 further comprising:
a thermally conductive filler disposed between the heating element and the first plate.

27. The support of claim 26, wherein the thermally conductive filler is at least one of a conductive paste, a conductive cement, a conductive adhesive, a conductive foam, a conductive gel, a metallic powder, a metallic fiber or a metallic mesh.

28. A substrate support for supporting a substrate, comprising:
a first metallic plate having a first surface and an opposing second surface;
a second metallic plate coupled to the first plate;
at least one guide having a central body disposed between the second surface of the first plate and a first surface of the second plate;
a channel formed in the central body;
a plurality of tabs extending from the central body, the tabs coupled to the second surface of the first plate; and
a resistive heating element disposed in the guide and urged against the second surface of the first plate.
29. The substrate support of claim 28, wherein at least one of the tabs is spot welded to the first plate.
30. The substrate support of claim 28, wherein the resistive heating element comprises a metallic sheath circumscribing an electrical conductor, the metallic sheath fabricated from material having a coefficient of thermal expansion substantially similar to a coefficient of thermal expansion of the first plate.
31. The substrate support of claim 30, wherein the metallic sheath and at least one of the first plate and the second plate are fabricated from stainless steel.
32. A heating chamber for heating a substrate, the chamber comprising:
a chamber body defining an interior volume,
a substrate storage cassette having walls;
a plurality of heated first support plates coupled to the walls and stacked parallel to each other within the interior volume, the first support plates having a first surface adapted to support the substrate; and
a heating element urged against a second side of each support plate, the second side opposing the first side.

33. The chamber of claim 32 further comprising:
a second plate coupled to the first plate and sandwiching the heating element therebetween.
34. The chamber of claim 32 further comprising:
at least one guide disposed proximate the heating element and laterally retaining the heating element relative to the second side of the first plate.
35. The chamber of claim 34, wherein the guide further comprises a heating element retaining channel formed therein.
36. The chamber of claim 34, wherein the guide further comprises a plurality of tabs extending from the guide, the tabs coupled to the first plate.
37. The chamber of claim 34, wherein the guide is fabricated from a material having a coefficient of thermal expansion substantially similar to a coefficient of thermal expansion of the first plate.
38. The chamber of claim 32, wherein the resistive heating element comprises a metallic sheath circumscribing an electrical conductor, the metallic sheath fabricated from material having a coefficient of thermal expansion substantially similar to a coefficient of thermal expansion of the first plate.
39. The chamber of claim 38, wherein the resistive heating element comprises a metallic sheath circumscribing an electrical conductor, the metallic sheath, the first plate and the guide fabricated from stainless steel.
40. The chamber of claim 32 further comprising:
a plurality of spacers coupled to the first surface of the each of the plate and/or the walls of the cassette, the spacers adapted to maintain the

substrate and the first surface in a spaced-apart relation.

41. A heating chamber for heating a substrate, the chamber comprising:
a chamber body defining an interior volume,
a substrate storage cassette having walls;
a plurality of heated first support plates coupled to the walls and stacked parallel to each other within the interior volume, the first support plates having a first surface adapted to support the substrate;
a metallic guide having a channel facing a second surface of the first support plate;
a resistive heating element disposed in the channel urged against a second side of each support plate, the second side opposing the first side; and
a second support plate sandwiching the guide with the first support plate.
42. A method for fabricating a heated support plate comprising:
providing a metallic first plate having a first surface adapted to support a substrate and an opposing second surface, and a second metallic plate;
forming a channel in at least one of the plates;
sandwiching a resistive heater disposed in the channel between the first and second plates; and
compressing the resistive heater from a non-compressed height to a compressed height equal to a depth of the channel.
43. A method for fabricating a heated support plate comprising:
providing a metallic first plate having a first surface adapted to support a substrate and an opposing second surface, and a second metallic plate;
positing at least one guide between the first and second plates, the at least one guide defining channel parallel to a plane of the first plate;
sandwiching a resistive heater having a height greater than a depth of the channel within the channel between the first and second plates.

44. The method of claim 43 further comprising urging the resistive heater against the first plate.

45. The method of claim 43 further comprising spot welding the guide to the first plate.

46. The method of claim 45, wherein step of spot welding further comprises welding tabs extending from a body of the guide, the channel formed in the body.